H. E. FIELD

PROCESS FOR CASTING MOLTEN MATERIALS.

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Fig. 1.

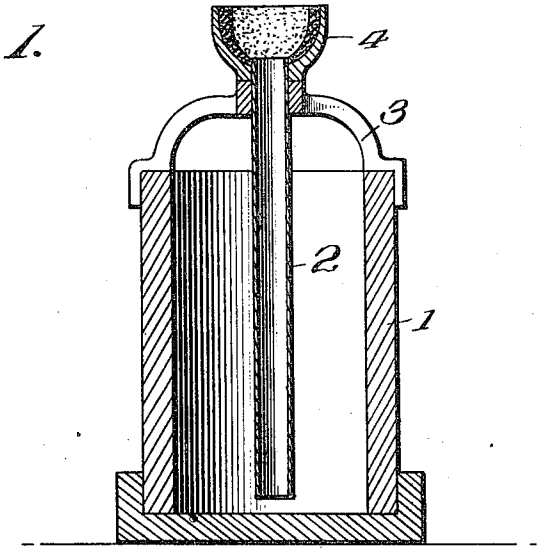
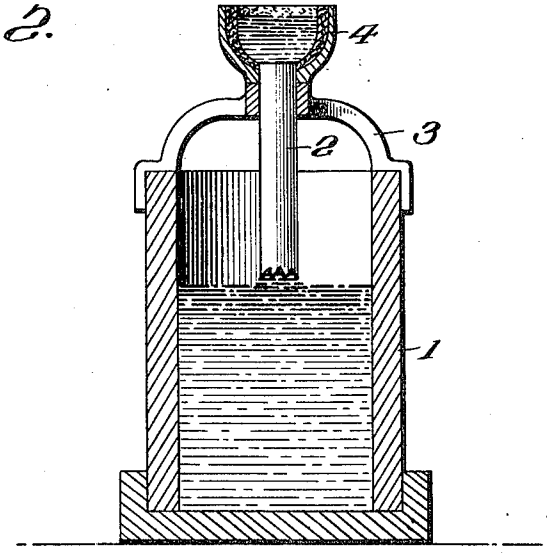


Fig. 2.



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PROCESS FOR CASTING MOLTEN MATERIALS.

1,184,523. Specification of Letters Patent. Patented May 23, 1916.

Application filed January 19, 1916. Serial No. 72,977.

To all whom it may concern:

Be it known that I, HERBERT E. FIELD, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Processes for Casting Molten Materials, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to an improvement in processes for casting molten materials.

My improved process consists in pouring the molten metal or materials through a tube into a mold, whereby the molten metal is conducted into the mold rapidly and quietly, with the least amount of agitation of the material and with no splashing of the metal or material on the sides of the mold.

In the ordinary pouring of the molten metal in the mold, the splash of the metal on the side of the mold solidifies immediately and does not dissolve, and when the ingots are rolled, hammered or forged these particles of splashed material form seams and cracks in the finished product. The quiet pouring through a tube, as employed in my process, effects a more satisfactory solidification of the material and prevents any splash resulting in an article which when rolled is free from seams and cracks.

By my improved process a further pronounced and advantageous result is brought about in obtaining the hottest material at the top of the mold, where it is most desirable to feed the shrinkage of the solidifying material below. This decreases the segregation and piping which otherwise takes place in the ingot during the ordinary pouring process.

My improved process may be used with any style or make of ingot or sand molds with large or small tops, or with the various contrivances which are used in connection with such molds to reduce what is known as "piping" in the ingot. This process can be used in the pouring of any molten materials into molds, either iron, steel, cast-iron and their alloys, aluminum, copper, lead, zinc, tin, antimony or any of their alloys.

In carrying out my improved process, the pouring tube through which the material is poured to the mold is preferably made of such material and thickness of wall that it will be melted off by the metal as it rises in the mold. The tube is preferably placed in the mold adjacent its lower end so that at any time during the process of pouring there is no splash. The tube must be of a material which when melted will not be harmful to the material of the casting. An alloy or element beneficial to the material which is being cast may be incorporated into the composition of the tube, so that when the tube is melted it forms a part of the ingot; *i. e.*, aluminum, nickel, titanium, vanadium, phosphorus, manganese, etc.

In the accompanying drawings I illustrate a form of apparatus in which my method can be practised.

Referring to the drawing—Figure 1 shows such an apparatus in vertical section with the pouring pipe in position before pouring the metal. Fig. 2 is a similar view showing how the pipe melts away as the metal rises in the mold.

In the drawing 1 is a mold of any desired form, and 2 the pouring pipe extending thereinto. This pipe 2 is supported by a cover or support 3 at the top of the mold 1, and the upper end of the pouring pipe 2 is provided with a suitable funnel-shaped end 4. In Fig. 1, the position of the pouring pipe is shown in the mold before pouring the molten metal through it into the mold, and in Fig. 2 the lower end of the pipe is shown melted away by the molten metal as it rises in the mold.

The tube may be constructed of sheet-metal or woven wire goods, riveted or lapped together, or it may be drawn, welded, rolled or cast pipe. The walls of the tube may be plain or may be perforated or slotted. The latter allows the metal to flow freely to the surface of the rising metal in the mold.

From the foregoing it will be observed, that the primary idea of my improved process, is to have the outlet end of the pouring pipe follow the rise of the molten material in the mold, so that it is adjacent the surface of the molten metal as the molten metal rises in the mold, whereby the advantageous result described is accomplished.

By using such a tube it has been found that an ingot can be cast in which there will be less piping and no cracks and thus greatly increasing the quality of the ingot without any material increase in the cost of the pouring.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. The improved process of casting molten metal, consisting in pouring it through a tube which depends into the mold, said tube adapted to melt as the metal rises in the mold to direct the poured metal at all times approximately at the surface of the metal in the mold, the melted portion of the tube entering into and forming a part of the cast metal.

2. A process of casting molten metal, consisting in pouring the metal through a tube directly into the mold, the tube being of such composition and thickness as to melt as the material rises in the mold and thus direct the molten metal directly on the top of the metal as it rises in the mold.

3. A process of casting molten metal, consisting in pouring the metal through a tube directly into the mold, said tube being of such composition as to improve the composition and condition of the metal as the tube melts at the surface of the metal.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

HERBERT EDWIN FIELD.

Witnesses:
H. S. BRADLEY,
HILDA YERTZELL.